

IMPROVING WRITING SKILLS THROUGH THE DUOLINGO APPLICATION

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Abstract:

This study investigates the use of Duolingo as a digital learning medium to improve Arabic writing skills (*maharah kitabah*), particularly vocabulary mastery and sentence structure accuracy. A qualitative descriptive design was employed to explore students' writing development during Duolingo-assisted learning. Data were obtained from students' writing products before and after using Duolingo, classroom observations, semi-structured interviews, and supporting documents. Data were collected through observation, interviews, and documentation, then analyzed using data reduction, data display, conclusion drawing, content analysis, and error analysis. The findings show that Duolingo contributes positively to Arabic writing development by increasing vocabulary diversity, improving word-choice accuracy, activating previously passive vocabulary, and strengthening the use of thematic vocabulary. Students also demonstrated better mastery of Arabic sentence structures, particularly *jumlah ismiyyah* and *jumlah fi'liyyah*, as reflected in reduced grammatical errors and improved sentence coherence. However, Duolingo remains limited in developing higher-order writing skills, such as idea organization and contextual written expression, which still require teacher guidance. The novelty of this study lies in examining Duolingo's contribution to Arabic writing through vocabulary mastery and sentence structure accuracy. The findings provide empirical evidence that digital learning applications can effectively complement Arabic writing instruction and support technology-enhanced language learning.

Keyword: Duolingo; Arabic Writing Skills; *Maharah Kitabah*; Vocabulary Mastery; Sentence Structure.

مستخلص البحث:

تهدف هذه الدراسة إلى استكشاف توظيف تطبيق دولينجو (Duolingo) بوصفه وسيلة تعليمية رقمية لتنمية مهارة الكتابة باللغة العربية، ولا سيما في جانب إتقان المفردات ودقة التراكيب اللغوية. واعتمدت الدراسة المنهج الكيفي ذي التصميم الوصفي للكشف عن تطور مهارات الكتابة لدى الطلاب أثناء عملية التعلم المدعومة بتطبيق دولينجو. جُمعت البيانات من إنتاجات الطلاب الكتابية قبل استخدام التطبيق وبعده، ومن الملاحظة الصفية، والمقابلات شبه المنظمة، والوثائق المساندة. وتم جمع البيانات من خلال الملاحظة والمقابلة والتوثيق، ثم تحليلها باستخدام أساليب اختزال البيانات، وعرضها، واستخلاص النتائج، إلى جانب تحليل المحتوى وتحليل الأخطاء. أظهرت نتائج الدراسة أن تطبيق دولينجو أسهم إيجابياً في تنمية مهارة الكتابة العربية من خلال زيادة تنوع المفردات، وتحسين دقة اختيار الكلمات، وتفعيل المفردات الكامنة وتحويلها إلى مفردات منتجة، فضلاً عن تعزيز استخدام المفردات الموضوعية في الكتابة. كما أظهر الطلاب تحسناً في إتقان تراكيب الجملة العربية، ولا سيما في استعمال الجملة الاسمية والجملة الفعلية، وهو ما تجلّى في انخفاض الأخطاء النحوية وتحسن ترابط

الجمال واتساقها. ومع ذلك، ما يزال التطبيق محدود الفاعلية في تنمية مهارات الكتابة المتقدمة، مثل تنظيم الأفكار والتعبير السياقي، الأمر الذي يستلزم استمرار توجيه المعلم وإشرافه. وتكمن جدة هذه الدراسة في تناولها إسهام تطبيق دولينجو في تطوير مهارة الكتابة العربية من خلال بُعدين أساسيين هما إتقان المفردات ودقة التراكيب اللغوية. وتقدم نتائجها دليلاً تجريبياً على أن تطبيقات التعلم الرقمية يمكن أن تمثل وسيلة داعمة فعالة في تعليم الكتابة باللغة العربية القائم على التكنولوجيا.

الكلمات المفتاحية: دولينجو؛ مهارة الكتابة باللغة العربية؛ مهارة الكتابة؛ إتقان المفردات؛ التراكيب اللغوية.

Abstrak:

Penelitian ini mengkaji pemanfaatan Duolingo sebagai media pembelajaran digital untuk meningkatkan keterampilan menulis bahasa Arab (*maharah kitabah*), khususnya dalam penguasaan kosakata dan ketepatan struktur kalimat. Penelitian ini menggunakan pendekatan kualitatif dengan desain deskriptif untuk mengeksplorasi perkembangan kemampuan menulis siswa selama proses pembelajaran berbantuan Duolingo. Data diperoleh dari hasil tulisan siswa sebelum dan sesudah menggunakan Duolingo, observasi pembelajaran, wawancara semi-terstruktur, serta dokumen pendukung. Data dikumpulkan melalui observasi, wawancara, dan dokumentasi, kemudian dianalisis menggunakan teknik reduksi data, penyajian data, penarikan kesimpulan, analisis isi, dan analisis kesalahan. Hasil penelitian menunjukkan bahwa Duolingo memberikan kontribusi positif terhadap pengembangan keterampilan menulis bahasa Arab melalui peningkatan keragaman kosakata, ketepatan pemilihan kata, aktivasi kosakata pasif menjadi aktif, serta penguatan penggunaan kosakata tematik. Siswa juga menunjukkan peningkatan penguasaan struktur kalimat bahasa Arab, terutama dalam penggunaan *jumlah ismiyyah* dan *jumlah fi'liyyah*, yang ditandai dengan berkurangnya kesalahan gramatikal dan meningkatnya koherensi kalimat. Namun demikian, Duolingo masih memiliki keterbatasan dalam mengembangkan keterampilan menulis tingkat lanjut, seperti pengorganisasian ide dan ekspresi kontekstual, sehingga tetap memerlukan bimbingan guru. Kebaruan penelitian ini terletak pada kajian mengenai kontribusi Duolingo terhadap keterampilan menulis bahasa Arab melalui penguasaan kosakata dan ketepatan struktur kalimat. Temuan penelitian ini memberikan bukti empiris bahwa aplikasi pembelajaran digital dapat menjadi media pendukung yang efektif dalam pembelajaran menulis bahasa Arab berbasis teknologi.

Kata kunci: Duolingo; keterampilan menulis bahasa Arab; *maharah kitabah*; penguasaan kosakata; struktur kalimat.

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INTRODUCTION

Arabic writing skill (*maharah kitabah*) is one of the essential productive language skills that enables learners to express ideas, thoughts, and feelings in written form using appropriate linguistic structures. Mastering this skill requires not only the ability to generate ideas but also the ability to employ vocabulary and grammatical structures accurately in written communication.¹ In Arabic

¹ Ahmadi M. Akhsan and Moh. Taufiqurrahman, "Interaksi Pembelajaran Dan Pengaruhnya Terhadap Kemampuan Maharah Kitabah Bahasa Arab 12," *Lahjah Arabiyah: Jurnal Bahasa Arab Dan Pendidikan Bahasa Arab* 6, no. 1 (2025): 55–67, <https://doi.org/10.35316/lahjah.v6i1.55-67>; Fahmi Hafizha Oktoviani, "Penerapan Scrapbook Dalam Pembelajaran Maharah Kitabah Siswa Kelas XI SMA Islam Al-Islah Bukittinggi," *Jurnal Pendidikan Dan Keguruan* 3, no. 4 (2025): 152–58.

language learning, writing is considered a complex skill because it integrates several linguistic components, including vocabulary mastery, morphology, syntax, spelling, and orthography.²

Among these components, vocabulary mastery (mufradat) and sentence structure are frequently identified as major challenges for learners. Students often experience difficulties in selecting appropriate vocabulary and constructing grammatically acceptable sentences, resulting in writing that lacks clarity, coherence, and accuracy.³ These challenges are particularly evident among secondary-level Arabic learners, where limited vocabulary knowledge and weaknesses in sentence construction hinder students from expressing ideas effectively in written Arabic.

Preliminary observations conducted during Arabic writing instruction revealed that many students encountered difficulties in developing written ideas due to restricted vocabulary resources and frequent errors in sentence construction. These problems were reflected in repetitive word usage, inappropriate lexical choices, and inaccuracies in applying Arabic sentence patterns. Such findings indicate that students require learning support that can facilitate vocabulary enrichment and provide intensive practice in sentence formation. However, it should be noted that vocabulary mastery alone does not automatically guarantee writing proficiency; effective writing also requires the ability to employ vocabulary appropriately within grammatically correct and meaningful sentence structures.

Writing skill plays an important role in language development because it supports learners' ability to organize and communicate ideas systematically. Situmorang argues that writing competence is closely related to students' ability to organize ideas both orally and in written form. Furthermore, previous studies have shown that instructional methods and learning media significantly influence students' writing development.⁴ Consequently, integrating digital technology into Arabic language instruction has become an increasingly relevant strategy for supporting writing development in contemporary educational settings.⁵

The rapid development of educational technology has created new opportunities for language learning through digital platforms. One of the most widely used language-learning applications is Duolingo. The application provides interactive exercises, vocabulary repetition, immediate feedback, and gradual sentence-construction activities that support language acquisition.

² Mohammad Salim Salim, "Challenges and Innovations in Teaching The Arabic Grammar to Non- Native Speakers," *Integrated Journal for Research in Arts and Humanities* 4, no. 5 (2024): 136–47, <https://doi.org/https://doi.org/10.55544/ijrah.4.5.21>; Noor Anida Awang et al., "Bridging Linguistic Gaps : Syntax and Morphology as Key Drivers in Enhancing Arabic Writing Skills," *International Journal Of Academic Research In Business And Social Sciences* 15, no. 11 (2025): 734–48, <https://doi.org/http://dx.doi.org/10.6007/IJARBS/v15-i11/26838>.

³ Awang et al., "Bridging Linguistic Gaps : Syntax and Morphology as Key Drivers in Enhancing Arabic Writing Skills"; Sitti Kuraedah, "Aplikasi Maharah Kitabah Dalam Pembelajaran Bahasa Arab," *Jurnal Al-Ta'dib* 8, no. 2 (2015): 82–98, <https://doi.org/https://doi.org/10.31332/atdb.v8i2.412>.

⁴ Suprayogi Suprayogi et al., "Pengembangan Keterampilan Menulis Siswa SMAN 1 Semaka Melalui Web Sekolah," *Madaniya* 2, no. 3 (2021): 283–94; Arifka Mahmudi Zainul Arifin, Suci Ramadhanti Febriani and Kddour Guettaoui Bedra, "Optimizing Arabic Writing Skills Based on TPACK Learning and Poster Media," *I J A Z A R A B I : Journal of Arabic Learning* 8, no. 3 (2025): 1235–49, <https://doi.org/D O I : 10.18860 /ijazarabi.V8i3.32329>.

⁵ Fatmawati, "Pemanfaatan Artificial Intelligence (AI) Dalam Meningkatkan Keterampilan Menulis Bahasa Arab," *Jurnal Pilar: Jurnal Kajian Islam Kontemporer* 16, no. 1 (2025): 67–77, <https://doi.org/https://doi.org/10.26618/tjkabq54>; Muhammad Jundi, "Tashmim Barnamaj Android Li Ta'ziz Itqan Al-Mufradat Lada Thullab Al-Madrasah Al-'Aliyah," *Lahjah Arabiyah: Jurnal Bahasa Arab Dan Pendidikan Bahasa Arab* 4, no. 2 (2023): 140–58, <https://doi.org/10.35316/lahjah.vxix.xx-xx>.

Previous analyses indicate that Duolingo facilitates vocabulary learning and offers contextualized language practice through translation and sentence-building tasks.⁶

Several studies have investigated the educational potential of Duolingo in Arabic language learning. Fikri, (2025) found that Duolingo enhances learner motivation through gamification features and flexible learning opportunities.⁷ Similarly, Taufiqurrahman et al., (2024) reported that Duolingo serves as an effective medium for developing maharah istima' in twenty-first-century language learning contexts.⁸ In addition, Novy Maryani et al., (2026) demonstrated that digital media, including Duolingo, contributes positively to Arabic language learning by promoting interactive and student-centered learning environments.⁹

Despite these positive findings, previous studies have primarily focused on speaking skills (maharah kalam), listening skills (maharah istima'), or the general use of digital media in Arabic learning. Limited attention has been given to the role of Duolingo in improving Arabic writing skill, particularly regarding vocabulary mastery and sentence structure as two critical components of writing performance. This gap indicates the need for further investigation into how Duolingo supports students' writing development through these specific linguistic dimensions.

The novelty of this study lies in its focus on analyzing the contribution of Duolingo to the improvement of Arabic writing skill through two specific indicators, namely vocabulary mastery and sentence structure. Unlike previous studies that examined Duolingo in relation to speaking, listening, or general language learning, this study specifically explores how the application supports students in enriching vocabulary and constructing grammatically accurate Arabic sentences as foundations for effective writing.

Therefore, this study aims to analyze the contribution of Duolingo in improving students' Arabic writing skill by examining the development of vocabulary mastery and sentence structure accuracy. The findings are expected to provide empirical insights into the utilization of digital learning applications as complementary tools for enhancing Arabic writing instruction.

METHOD

This study employed a qualitative approach with a descriptive design. A qualitative approach was selected because the study aimed to explore and describe students' experiences, learning processes, and changes in Arabic writing skills during the use of Duolingo as a digital learning medium. The focus of the study was not to measure causal relationships statistically, but rather to understand how Duolingo contributed to the development of vocabulary mastery and sentence structure in students' Arabic writing. Therefore, a qualitative descriptive design was considered appropriate for capturing the phenomenon in its natural learning context.¹⁰

The research was conducted at Madrasah Aliyah Unggulan Wahab Hasbullah (MAUWH). Research participants were selected through purposive sampling. This technique was chosen because participants were required to meet specific criteria relevant to the objectives of the study.

⁶ Zia Erika Khairunnisa, Misdaisah, Syifa Amalia Prabowo, Ummu Aimah Zhafitri and Alfareza Khalyila, "Analysis Of Arabic Language Materials In The Duolingo Application," in *Proceeding International Conference on Arabic Language Teaching (NATHLA)*, 2024, 1–6, <https://e-proceedings.iain-palangkaraya.ac.id/index.php/natla/article/view/10670/pdf>.

⁷ Fikri, (2025)

⁸ Taufiqurrahman, Mad Ali, (2024)

⁹ Novy Maryani, Dadan Nugraha, Kamilah Eka, (2026)

¹⁰ Rizal Safarudin, Martin Kustati, and Nana Sepriyanti, "Penelitian Kualitatif," *Innovative: Journal Of Social Science Research Volume* 3, no. 2 (2023): 9680–94.

The selection criteria included: (1) students who actively participated in Arabic writing (kitabah) learning activities; (2) students who used the Duolingo application during the learning process; and (3) students who produced writing assignments before and after the implementation of Duolingo-based learning. These criteria enabled the researcher to obtain information-rich data regarding the role of Duolingo in improving vocabulary mastery and sentence structure.

The study utilized both primary and secondary data sources. Primary data consisted of students' Arabic writing products before and after using Duolingo, observation records of learning activities, and data obtained through semi-structured interviews with students. Secondary data included supporting documents such as Arabic learning syllabi, instructional materials, vocabulary exercises, and sentence-structure materials available in the Duolingo application.¹¹

Data were collected through three techniques: observation, semi-structured interviews, and documentation. Observation served as the primary data collection technique because this study focused on examining the learning process during the implementation of Duolingo. Observations were conducted during classroom activities to record students' participation, engagement, responses, and the ways they applied vocabulary and sentence structures in their writing. Observation data also helped identify learning challenges encountered by students throughout the implementation process.¹²

Semi-structured interviews were conducted to obtain in-depth information regarding students' experiences, perceptions, and strategies when using Duolingo to support Arabic writing development. This technique allowed participants to explain their learning experiences while providing flexibility for the researcher to explore emerging issues related to vocabulary acquisition and sentence construction.¹³

Documentation was employed to complement observation and interview data. The documents analyzed included students' writing products before and after using Duolingo, learning records, and supporting instructional materials. These documents were used to identify patterns of vocabulary development, improvements in sentence structure, and changes in students' writing performance over time.¹⁴

Data analysis followed the interactive model consisting of data reduction, data display, and conclusion drawing.¹⁵ In the data reduction stage, the researcher selected, categorized, and coded data related to vocabulary mastery and sentence structure. Subsequently, the organized data were presented in the form of narrative descriptions and classification tables showing patterns of language development and writing errors. Finally, conclusions were drawn by interpreting recurring patterns, identifying improvements in students' writing, and explaining the contribution of

¹¹ Nada Nabilah Syafiqoh et al., "Innovation In The Assessment Of Maharah Kitabah Based On AKM Arabic Books Kemenag," *Lahjah Arabiyah: Jurnal Bahasa Arab Dan Pendidikan Bahasa Arab* (LP2M Universitas Ibrahimy, 2023), <https://doi.org/10.35316/lahjah.v4i1.20-33>; Abdul Malik Karim Amrullah Ainun Suci Qur'ani, Maulidi, Nuril Mufidah, "Idarotu Baramij Al-Lughah Al-'Arabiyah Fi Qismi Al- Lughah Lada Al-Tholabat Bima'had Darul Aman," *Lahjah Arabiyah: Jurnal Bahasa Arab Dan Pendidikan Bahasa Arab* 5, no. 2 (2024): 120–29, <https://doi.org/10.35316/lahjah.v5i2.120-129>.

¹² Safarudin, Kustati, and Sepriyanti, "Penelitian Kualitatif."

¹³ Ainun Suci Qur'ani, Maulidi, Nuril Mufidah, "Idarotu Baramij Al-Lughah Al-'Arabiyah Fi Qismi Al-Lughah Lada Al-Tholabat Bima'had Darul Aman."

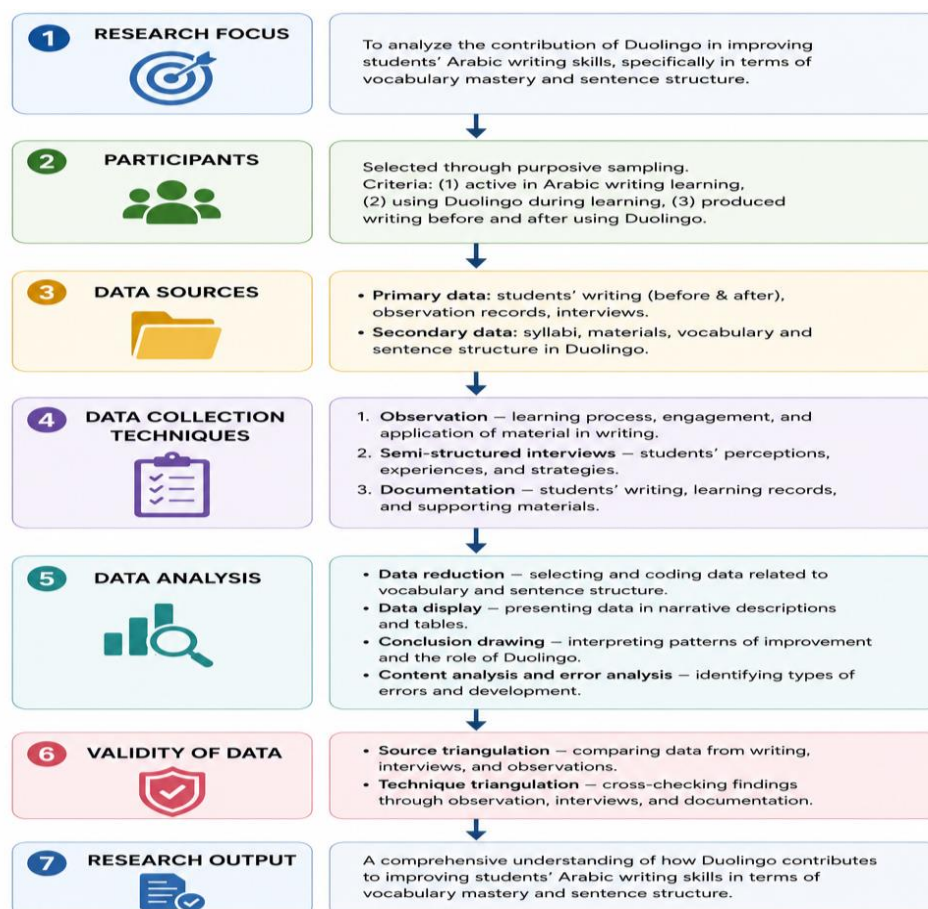
¹⁴ Natalina Nilamsari, "Memahami Studi Dokumen Dalam Penelitian Kualitatif," *Wacana* XIII, no. 2 (2014): 177–81, <https://doi.org/https://doi.org/10.32509/wacana.v13i2.143>.

¹⁵ Windi Kurniawati Alviaderi Novianti, "Potraying Students' Language Problems In Comprehending Narrative Reading Text," *The Journal of English Language Teaching, Literature, and Applied Linguistics [JELA]* 3, no. 1 (2021): 22–34, <https://doi.org/https://doi.org/10.37742/jela.v3i1.38>.

Duolingo to the development of vocabulary and sentence structure. To strengthen the analysis, content analysis and error analysis were employed to identify linguistic patterns, types of errors, and indicators of writing improvement.¹⁶

To ensure the trustworthiness of the findings, the study applied source triangulation and technique triangulation. Source triangulation was conducted by comparing data obtained from students' writing products, interviews, and observation records. Technique triangulation was carried out by cross-checking findings generated through observation, interviews, and documentation. These procedures enhanced the credibility and consistency of the research findings.

Figure 1. Research Roadmap (Methodology of the Study)



RESULTS AND DISCUSSION

This study shows that using the Duolingo app improves students' writing skills, particularly in Arabic vocabulary and sentence structure. Learning with the help of this application helps students write in a more varied, structured, and contextually appropriate manner. The vocabulary used is no longer limited to basic words, but now includes verbs (fi'il), nouns (isim), and adjectives that are appropriate to the context of the sentence.

¹⁶ Ade Firmannandya Meirza Nanda Faradita, Kunti Dian Ayu Afiani, "Teacher's Creativity in Making Video Based Learning in Post Pandemi Covid-19," *Jurnal Bidang Pendidikan Dasar* 7, no. 1 (2023): 1–11, <https://ejournal.unikama.ac.id/index.php/JBPD>.

In terms of vocabulary, learners experienced an increase in the number and variety of words used in their writing. Before using Duolingo, learners' writing tended to be limited to basic vocabulary and often repeated the same words. After learning with Duolingo, learners began to use a more diverse vocabulary, including nouns, verbs, and adjectives. This vocabulary was used more appropriately in accordance with the context of the sentence, especially in everyday themes that often appeared in Duolingo material. Content-based writing learning had a significant impact on improving students' writing skills and motivation to learn Arabic. This approach encourages students to write with a richer vocabulary, more accurate grammar, and to organize the ideas in a structured and contextual way ¹⁷. This indicates that the thematic and repetitive presentation of vocabulary in the Duolingo application helps to strengthen vocabulary comprehension and application in writing activities.

1. Analysis of Vocabulary in Writing Skills

Table. 1. Students' Vocabulary Improvement in Arabic Writing Before and After Using Duolingo

No	Vocabulary Aspects	Example before using Duolingo	Example After using Duolingo	Description
1.	Increased Vocabulary Variety	أذهب إلى المدرسة في الصباح. المدرسة قريبة من البيت. أحب المدرسة. (In this example, the word المدرسة is used repeatedly without any variation in supporting vocabulary.)	أذهب إلى المدرسة في الصباح، وهي مكان للتعلّم واكتساب المعرفة، كما ألتقي فيها بالأصدقاء. (After using Duolingo, students began to demonstrate a more diverse vocabulary that was appropriate for the context of their writing.)	- Before using the Duolingo app, students' writing tended to use limited and repetitive vocabulary. Students often repeated the same words in a single paragraph, making their writing appear monotonous. - This example shows that the student is beginning add new vocabulary such as التعلّم and المعرفة, making the sentences richer in meaning..
2.	Accuracy in Word Choice	أنا أقرأ الطعام كل يوم. (The word أقرأ (to read) is used incorrectly in this context and should be replaced with أكل (to eat).)	أنا أكل الطعام كل يوم في البيت (After learning with Duolingo, students are better able to choose vocabulary that matches the intended meaning.)	- The analysis also showed an improvement in vocabulary accuracy. Before using Duolingo, students often used words that were semantically inappropriate even though the sentence structure was correct.
3.	Transition from Passive to Active Vocabulary	في المساء، أنا أدرس في البيت. (The sentence only uses basic vocabulary without utilising other vocabulary that students have already understood, such as expressions	في وقت الفراغ، أدرس في البيت لتطوير مهارتي في اللغة العربية. After using Duolingo, students began to activate previously passive vocabulary and use it in more meaningful sentence contexts.	- Students tend to use simple and common vocabulary, avoiding more complex words even if they are passively familiar with them - Students tend to use simple and common vocabulary, avoiding more complex words even if they are passively familiar with them

¹⁷ Fitri Handayani Harahap, Virza Mimantasyah, and Salwa Salsabilla, "Utilization of Original Texts in Kitabah to Motivate and Develop Arabic Writing Skills," *Jurnal Nasional Holistic Science* 5, no. 2 (2025): 119–23.

		of free time or the purpose of activities.)		- In this example, the vocabulary words وقت الفراغ and تطوير مهارتي Demonstrate that students not only understand these words, but can also actively use them in writing. This indicates an increase in vocabulary productivity in writing skills as a result of the repetitive and contextual practice provided by the Duolingo app.
4.	Use of Thematic Vocabulary	أكون في البيت مع أسرتي (The sentence uses very basic vocabulary and does not yet show specific activities related to a particular theme.)	أقضي وقتي في البيت مع أسرتي، وأساعدهم في تنظيف الغرفة وترتيب الأدوات (After learning with Duolingo, students began to use vocabulary related to household activities.)	- Before using Duolingo, students tended to write using common vocabulary that did not clearly reflect the theme. - In this example, the vocabulary تنظيف الغرفة and ترتيب الأدوات demonstrates the application of thematic vocabulary acquired from Duolingo material. This indicates that students are able to associate vocabulary with specific thematic contexts, resulting in writing that is clearer, more focused, and more meaningful in terms of writing skills.

The findings indicate that students demonstrated substantial improvement in vocabulary use after learning through Duolingo. The improvement was reflected not only in the increased quantity of vocabulary used but also in the diversity, contextual appropriateness, and productive application of vocabulary in writing. Prior to using Duolingo, students tended to rely on repetitive and limited vocabulary, resulting in simple and monotonous written texts. After the implementation of Duolingo, students began to incorporate a wider range of nouns (isim), verbs (fi'il), and adjectives that were more suitable to the context of their writing.

From a theoretical perspective, vocabulary mastery constitutes a fundamental component of writing development because lexical knowledge enables learners to transform ideas into meaningful written expressions. According to Awang et al., (2025), vocabulary and morphological knowledge significantly influence the quality of Arabic writing because learners require adequate lexical resources to construct coherent and meaningful texts.¹⁸ The present findings support this argument, as students who acquired additional vocabulary through Duolingo were able to produce richer and more detailed written expressions.

¹⁸ Awang et al., (2025)

The increase in vocabulary diversity can also be explained through Duolingo's learning design, which emphasizes thematic vocabulary presentation and repetitive exposure. The application repeatedly introduces vocabulary within meaningful contexts, allowing learners to encounter words in multiple situations before using them independently. This finding is consistent with Hussin & Normeza, (2014), who argue that repeated vocabulary exposure facilitates lexical retention and minimizes language interference among beginner learners.¹⁹ Through repeated encounters with vocabulary items, students gradually moved from recognition to productive usage.

Another significant finding concerns the improvement in vocabulary accuracy. Before using Duolingo, students frequently selected words that were semantically inappropriate despite producing grammatically acceptable sentences. After participating in Duolingo-based learning activities, students demonstrated better lexical choices that aligned with the intended meaning of the sentence. This finding suggests that vocabulary learning should not be limited to memorization but should involve contextualized language use. Such a finding is consistent with Erika Khairunnisa et al., (2024), who found that Duolingo provides contextual vocabulary practice that supports meaningful language production rather than isolated word learning.²⁰

The findings also reveal a transition from passive vocabulary to active vocabulary use. Students began utilizing vocabulary items that they previously recognized receptively but rarely employed in their writing. This phenomenon can be interpreted through language acquisition theory, which distinguishes between receptive and productive vocabulary knowledge. Through continuous practice and contextual reinforcement, Duolingo appears to facilitate the conversion of receptive vocabulary into productive vocabulary. This result supports the findings of Jundi, (2023), who reported that technology-assisted vocabulary learning contributes to vocabulary activation and retention among Arabic language learners.²¹

Furthermore, students demonstrated greater use of thematic vocabulary after learning with Duolingo. Their writing increasingly reflected specific themes, activities, and contexts rather than relying on general expressions. This finding aligns with Harahap et al., (2025), who argue that contextual and content-based language learning encourages students to produce more meaningful and organized written texts. Thematic vocabulary use not only enriches lexical variety but also contributes to textual coherence and communicative effectiveness.²²

However, the findings also indicate that vocabulary growth alone does not automatically guarantee high-quality writing. Some students who acquired new vocabulary still experienced difficulties organizing ideas and maintaining grammatical accuracy. This observation suggests that vocabulary development should be accompanied by systematic instruction in sentence construction and text organization. Therefore, vocabulary mastery should be viewed as one important component of writing proficiency rather than the sole determinant of successful writing performance.

¹⁹ Hussin & Normeza, (2014)

²⁰ Erika Khairunnisa, Misdaisah, Syifa Amalia Prabowo, Ummu Aimah Zhafitri & Khalya, (2024)

²¹ Jundi, "Tashmim Barnamaj Android Li Ta'ziz Itqan Al-Mufradat Lada Thullab Al-Madrasah Al-'Aliyah."

²² Harahap et al., (2025)

2. Analysis of Sentence Structure in Writing Skills

Table.2. Students' Sentence Structure in Arabic Writing Before and After Using Duolingo

No	Aspects of Sentence Structure	Example before using Duolingo	Example After using Duolingo	Description
1.	Number of Ismiyyah (جملة اسمية)	الطالب يدرس مجتهد. (This sentence is incorrect because the structure of the khabar does not match the mubtada')	الطالب مجتهد في دراسته (After using Duolingo, students began to understand the basic patterns of ismiyyah numbers, namely the relationship between mubtada' and khabar. Students were able to construct sentences that were more structurally accurate and richer in meaning by adding supporting information.)	Before learning with Duolingo, students often had difficulty constructing ismiyyah sentences correctly. Common mistakes included inconsistencies between mubtada' and khabar, as well as the use of overly simple khabar without any development of meaning. Sentences tended to be short and uninformative.
2.	Number of Fi'liyyah (جملة فعلية)	أنا يذهب إلى المدرسة كل يوم (Errors in verb forms that do not match the subject)	أنا أذهب إلى المدرسة كل يوم (After learning with Duolingo, students showed improvement in understanding verb conjugations according to the subject of the sentence. The sentences they produced became more structurally correct and complete.)	- In the early stages, students often make mistakes in the use of fi'liyyah, especially in the agreement between fi'il and fā'il. Mistakes in changing fi'il according to the subject are also still frequently found. - Students are able to adjust fi'il to fā'il and add time information, so that sentences become more coherent and informative.

The findings demonstrate that students experienced notable improvement in constructing Arabic sentence structures after using Duolingo. Improvements were observed in both nominal sentences (jumlah ismiyyah) and verbal sentences (jumlah fi'liyyah). Students became more capable of establishing appropriate relationships between mubtada' and khabar, as well as applying correct agreement between fi'il and fā'il.

These findings support the argument proposed by Awang et al., (2025), who emphasize that syntactic competence is a crucial determinant of Arabic writing quality. Writing proficiency requires learners not only to possess vocabulary knowledge but also to understand how words function within grammatical structures.²³ Prior to the implementation of Duolingo, students frequently produced sentences containing subject-predicate inconsistencies and incorrect verb

²³ Awang et al., (2025)

conjugations. Such errors are commonly observed among novice Arabic learners due to limited exposure to authentic sentence patterns.

The improvement observed in this study may be attributed to Duolingo's scaffolded learning structure. The application introduces sentence patterns gradually through translation tasks, sentence completion activities, and contextualized exercises. These activities repeatedly expose students to correct grammatical structures, allowing learners to internalize Arabic sentence patterns through practice. This finding is consistent with Shazia Saleem, (2025), who argues that grammar acquisition becomes more effective when learners engage with grammatical forms in meaningful contexts rather than through isolated rule memorization.²⁴

The findings further indicate that students became increasingly capable of distinguishing between *jumlaḥ ismiyyah* and *jumlaḥ fi'liyyah*. This development is important because these two sentence patterns constitute the foundation of Arabic syntax. The reduction in grammatical errors suggests that repeated exposure to authentic sentence models can strengthen learners' syntactic awareness. Similar findings were reported by Asmilia et al., (2025) and Habib, (2025), who found that continuous engagement with Arabic linguistic structures significantly improves students' ability to apply grammatical patterns accurately.²⁵

Another noteworthy finding concerns the role of feedback in sentence development. Duolingo provides immediate corrective feedback whenever learners make grammatical mistakes. Such feedback allows students to identify errors and revise their responses immediately. From the perspective of language learning theory, immediate feedback contributes to the formation of accurate linguistic habits and reduces fossilization of errors. Therefore, the observed improvement in sentence structure may not only result from repeated practice but also from the availability of instant corrective mechanisms embedded within the application.

Nevertheless, the findings reveal that although students showed improvement in sentence-level accuracy, more complex writing abilities such as paragraph organization, argument development, and stylistic variation were still limited. This observation suggests that Duolingo is particularly effective in supporting micro-level writing skills, including vocabulary acquisition and sentence formation, but should be complemented by teacher-guided writing instruction to develop higher-order writing competencies.

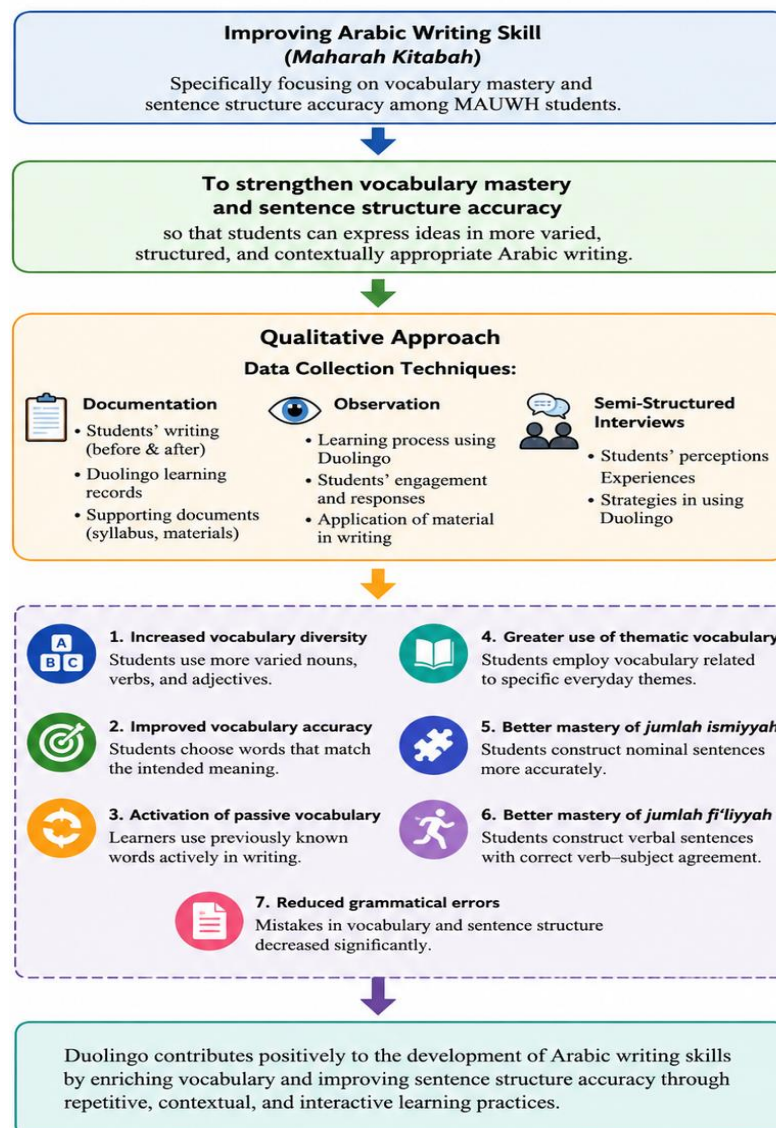
Overall, the findings indicate that Duolingo contributes positively to the development of Arabic writing by strengthening two fundamental components of writing proficiency: vocabulary mastery and sentence structure accuracy. These findings extend previous studies that primarily focused on speaking skills Fikri, (2025)²⁶ and listening skills,²⁷ by providing empirical evidence regarding the contribution of Duolingo to Arabic writing development.

²⁴ Shazia Saleem, Saira Qasim, (2025)

²⁵ Asmilia et al., (2025; Habib, (2025)

²⁶ Fikri, (2025)

²⁷ Taufiqurrahman, Mad Ali, "Analisis Penggunaan Duolingo Sebagai Media Pembelajaran Maharah Istima' Pada Abad 21."

Figure 2. Conceptual Flow of the Study

CONCLUSION

This study concludes that the use of the Duolingo application contributes positively to the development of students' Arabic writing skills, particularly in terms of vocabulary mastery and sentence structure accuracy. The findings indicate that Duolingo supports students in expanding vocabulary diversity, improving the appropriateness of word choice, activating previously passive vocabulary, and utilizing thematic vocabulary more effectively in writing. In addition, the application contributes to students' understanding of Arabic grammatical structures, especially in constructing *jumlah ismiyyah* and *jumlah fi'liyyah*, as reflected in the reduction of errors related to *mubtada'*-*khabar* correspondence and *fi'il-fā'il* agreement.

The contribution of Duolingo lies in its provision of thematic learning materials, repetitive practice, sentence-construction activities, and immediate feedback, which collectively facilitate vocabulary acquisition and syntactic development. These features enable students to engage in continuous practice and become more familiar with authentic language patterns, thereby supporting the development of foundational writing competencies in Arabic.

From a pedagogical perspective, the findings suggest that digital learning applications such as Duolingo can serve as effective complementary tools in Arabic language instruction, particularly for strengthening vocabulary learning and sentence structure mastery. The integration of technology-based learning media may increase students' engagement, learning autonomy, and practice intensity, which are essential factors in developing writing proficiency. Nevertheless, the findings also reveal that Duolingo alone is insufficient for developing higher-order writing skills, such as idea organization, contextual expression, and extended written discourse. Therefore, teacher guidance and classroom-based writing activities remain essential components of effective Arabic writing instruction.

This study is limited to examining the contribution of Duolingo to vocabulary mastery and sentence structure within the context of Arabic writing development. Future studies are recommended to investigate the effectiveness of Duolingo in improving broader aspects of writing proficiency, including paragraph development, coherence, cohesion, and argumentative writing. Further research may also employ mixed-methods or experimental designs involving larger participant groups to provide more comprehensive evidence regarding the role of digital learning applications in Arabic language education.

Finally, the findings encourage educators and curriculum developers to explore the integration of digital learning media into Arabic language instruction. The combination of classroom learning and technology-assisted practice has the potential to create more engaging, flexible, and learner-centered learning environments that support the development of Arabic language skills in the digital era.

AUTHOR CONTRIBUTION STATEMENT

Adelia Eka Putri contributed to the conceptualization and design of the study, methodology development, validation, formal analysis, investigation, data curation, manuscript drafting, manuscript review and editing, visualization, and supervision of the research process. M. Dzikrul Hakim Al Ghozali contributed to the investigation, manuscript review and editing, and visualization. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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